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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,620	03/29/2004	Shizuo Akira	57156-DIV (71526)	3375

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EDWARDS & ANGELL, LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER	
KOSSON, ROSANNE	
ART UNIT	**PAPER NUMBER**
1653	

DATE MAILED: 07/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/812,620	AKIRA ET AL.	
	Examiner	Art Unit	
	Rosanne Kosson	1653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-7 and 10-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-7 and 10-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *March 29, 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/29 & 10/8/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 3-7 and 10-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, claims 3 and 10 recite any amino acid sequence that varies from SEQ ID NO: 2 by the addition, deletion or substitution of any one or any two amino acids. Claims 5 and 12 recite DNA that hybridizes under a stringent condition to DNA encoding SEQ ID NO: 2 or encoding any amino acid sequence that varies from SEQ ID NO: 2 by the addition, deletion or substitution of any one or any two amino acids.

Regarding the variants of SEQ ID NO: 2, no such variants are disclosed in the specification. That SEQ ID NO: 2 may vary in this way is not even mentioned in the specification. Thus, one of skill in the art would have no idea which variants Applicants have in mind that they wish to include within the scope of the claimed invention.

Regarding the stringent condition, this may be a translation error, as procedures involving hybridization to DNA are, at critical points, usually carried out under stringent

conditions. But these conditions vary, as they are determined and applied by each individual scientist for each experiment. The specification does not disclose which condition is stringent or what the quantitative or qualitative value of the stringent condition is.

Thus, the lack of written description in claims 5 and 12 is two-fold, as they recite DNA that hybridizes to DNA encoding SEQ ID NO: 2 or a variant thereof under unknown conditions (one of skill in the art would not know what sort of DNA would hybridize), and they recite that the DNA to which the claimed DNA hybridizes encodes unknown proteins.

Consequently, there is no evidence that any representative species of such large and varied genera- i) a stringent condition and ii) amino acid sequences that vary from SEQ ID NO: 2 by the addition, deletion or substitution of any one or any two amino acids- were in the possession of the inventors at the time of filing. To satisfy the written description aspect of 35 U.S.C. 112, first paragraph, for a claimed genus of molecules, it must be clear that: (1) the identifying characteristics of the claimed molecules have been disclosed, e.g., structure, physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these; and (2) a representative number of species within the genus must be disclosed. Because no stringent condition is disclosed and no variants of SEQ ID NO: 2 are disclosed, the claims fail to satisfy the written description requirement.

Claims 3-7 and 10-14 are also rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the protein of SEQ ID NO: 2, does not reasonably provide enablement for any protein that varies from SEQ ID NO: 2 by the addition, deletion or substitution of any one or any two amino acids. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. As discussed above, only the protein of SEQ ID NO: 2 is disclosed; no variants are disclosed.

As a result, the scope of the instant claims is not commensurate with the enablement of the instant disclosure, because practice of the claimed invention would require undue experimentation by an artisan of ordinary skill in the art to determine which one or two or more amino acids may be added, deleted or substituted without the loss of macrophage activating ability and without the loss of responsiveness to or reaction with NF-IL6.

The factors to be considered in determining whether undue experimentation is required are summarized In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). The court in Wands states: "Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' " (Wands, 8 USPQ2d 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single,

simple factual determination, but rather is a conclusion reached by weighing many factual considerations." (Wands, 8 USPQ2d 1404). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary (immense, because Applicants assert that variants of SEQ ID NO: 2 that vary by any number of amino acids retain the functions of SEQ ID NO: 2, but none of these variants are identified in the specification), (2) the amount of direction or guidance presented (guidance is presented for only SEQ ID NO: 2, not for any variants), (3) the presence or absence of working examples (none related to variants of SEQ ID NO: 2), (4) the nature of the invention (any variant of SEQ ID NO: 2 that activates macrophages and induced by NF-IL6), (5) the state of the prior art (an NF-IL6-inducible, macrophage C-type lectin corresponding to SEQ ID NO: 2 was published in GenBank Record No. AB024717), (6) the relative skill of those in the art (very high, that of highly trained research scientist), (7) the predictability or unpredictability of the art (see below), and (8) the breadth of the claims (broad, as discussed above).

With respect to the quantity of experimentation necessary, to demonstrate that any variant of SEQ ID NO: 2 retains the functions of SEQ ID NO: 2, many random variants of SEQ ID NO: 2, additions such as fusion proteins, deletions and substituted proteins would have to be made, and experiments would have to be conducted under a wide range of conditions. In these experiments, many concentrations and relative ratios of variant protein, NF-IL6 and macrophages would have to be tested, as the claims do not recite any concentrations or relative amounts. The results of the experiments would

have to show that a large number of all kinds of variants of SEQ ID NO: 2 at a large range of concentrations retain the functions of SEQ ID NO: 2.

Such experimentation is necessary because the specification does not describe any functional variants of SEQ ID NO: 2 but claims all of them. The specification also does not describe any systematic method by which functional variants of SEQ ID NO: 2 could be identified and then produced. There is a large gap between Applicants' disclosure and the amount of information needed to prepare functional variants of SEQ ID NO: 2. One of skill in the art would have to experiment unduly to fill in this gap. To be commensurate in scope with a broad claim for any functional variant of SEQ ID NO: 2, a great deal of guidance must be present in the specification to enable one of skill in the art to prepare a number of these proteins. As noted above, none have been identified.

Regarding predictability, each variant of SEQ ID NO: 2 would have a different ability to activate macrophages and a different ability to be induced by NF-IL6. Compared to the reference sequence, SEQ ID NO: 2, these abilities may be none, reduced to any degree, the same or enhanced to any degree. One of skill in the art would not know in advance, and random preparation and testing of each would be required. Therefore, one of skill in the art could not predict, given the specification, that any variant of SEQ ID NO: 2 would be functional.

Accordingly, the claims fail to satisfy the enablement requirement.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, these claims recite a polynucleotide consisting of at least 14 bases of DNA. This claim language is confusing as "consisting of" is understood to be closed terminology, the recited elements and nothing more. A DNA sequence may consist of 14 bases. But a claimed DNA molecule of 14 or more bases cannot be described with closed terminology, as the claimed range is open-ended. If appropriate, the claims may be amended to recite a DNA molecule consisting of 14 bases that hybridizes to another claimed DNA molecule, or a DNA molecule comprising 14 bases that hybridizes to another claimed DNA molecule.

Additionally the claims appear to be a translation from a foreign language, replete with grammatical and translation errors that render the intended meaning unclear. For example, claims 3 and 10 recite a "sequence table." The application does not contain a sequence table, but "sequence listing" may have been meant. Also, claims 3 and 10 recite "having an activation ability macrophages." Applicants may have meant "having the ability to activate macrophages." Appropriate correction is requested.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 3-6 and 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsumoto et al., GenBank Record No. AB024717, published on September 3, 1999. This record discloses a nucleic acid sequence that differs from SEQ ID NO: 1 by 17 nucleotides. 2500 of 2517 nucleotides are identical (99.3% sequence identity, see enclosed nucleotide alignment). The GenBank nucleic acid sequence, AB024717, encodes a protein, GenBank No. BAA83754, that has 100% sequence identity to SEQ ID NO: 2 (see enclosed amino acid alignment). Thus, a holding of anticipation is required.

Claims 6 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Lal et al. (US 2002/0182671). Lal et al. disclose a polynucleotide comprising at least 14 bases that hybridize to a nucleic acid molecule encoding SEQ ID NO: 2. See enclosed alignments (Result 2 and Result 3), in particular nucleotides 378-413 of the Db sequence in Result 2 and 491-515 of the Db sequence in Result 3. Lal et al. have priority to US 60/149,641, filed August 17, 1999 (Incyte clone no. 1521513, SEQ ID NO: 13). Therefore, a holding of anticipation is required.

Claims 6 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Yuqui et al. (US 6,387,697). Yuqui et al. disclose a polynucleotide comprising at least 14 bases that hybridize to a nucleic acid molecule encoding SEQ ID NO: 2. See enclosed alignment, Result 10, in particular nucleotides 167-185 of the Db sequence. Therefore, a holding of anticipation is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al., GenBank Record No. AB024717, Lal et al. (US 2002/0182671) and Yuqui et al. (US 6,387,697), in view of Mullan (US 5,455,169). The teachings of Matsumoto et al., Lal et al. and Yuqui et al. are discussed above. The cited references,

however, do not disclose labeled DNA molecules. Mullan discloses DNA molecules that are labeled by incorporation of radiolabeled nucleotides, such as nucleotides labeled with H3, C14, S35 or P32). DNA molecules are also labeled by incorporation of nucleotides that are biotinylated are can be detected by marked avidin (avidin containing a fluorescent marker or enzyme activity) (see col. 6, line 62, to col. 7, line 2). DNA molecules are labeled for their detection in a sample. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to label the claimed DNA molecules containing at least 14 bases as disclosed by Mullan, because these DNA molecules would have been used as probes for detecting other claimed DNA molecules, such as those of claims 3, 4, 10 and 11. In order to function as probes, i.e., detection reagents, they would have to have had a detectable label. Therefore, a holding of obviousness is required.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosanne Kosson whose telephone number is 571-272-2923. The examiner can normally be reached on Monday-Friday, 8:30-6:00, with alternate Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rosanne Kosson
Examiner
Art Unit 1653

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2005-06-27

ROBERT A. WAX
PRIMARY EXAMINER
Art Unit 1653